

PHILIPPINE TERMITES COLLECTED BY R. C. MCGREGOR,
WITH DESCRIPTIONS OF ONE NEW GENUS
AND NINE NEW SPECIES

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FOUR PLATES

During 1917 and 1918 Mr. R. C. McGregor, of the Bureau of Science, Manila, made extensive collections of termites in Luzon and Panay in order to get some further knowledge of the Philippine termite fauna. Among the species obtained are the following nine which seem to be new to science:

- Calotermes (Neotermes) lagunensis.*
- Rhinotermes (Schedorhinotermes) bidentatus.*
- Termitogetonella g. nov. tibiaoensis.*
- Odontotermes mediodentatus.*
- Eutermes (Eutermes) castaneus.*
- Eutermes (Eutermes) las-piñasensis.*
- Eutermes (Rotunditermes) culasiensis.*
- Eutermes (Grallatotermes) panayensis.*
- Capritermes paetensis.*

It is a striking fact that the majority of the species in the Panay collection are quite different from those hitherto known from Luzon. Therefore, it is reasonable to suppose that the Philippine termite fauna may be extraordinarily rich, since the larger part of the Islands is unexplored.

Coptotermes formosanus, the commonest termite in Formosa and in South China, is here recorded from the Philippine Islands for the first time. This species is a formidable pest to wooden structures and wood products.

Here I express my hearty thanks to Mr. McGregor, by whose courtesy I was able to examine the collections.

PROTERMITIDÆ

CALOTERMITINÆ

Genus CALOTERMES Hagen

Calotermes (*Neotermes*) *malatensis* Oshima. Plate 1, fig. 1.

Calotermes (*Neotermes*) *malatensis* OSHIMA, Philip. Journ. Sci. § D
12 (1917) 221 (Luzon, Manila, Malate).

LUZON, Manila, Malate, October 10, 1917.

Remarks.—A single specimen (imago).

Calotermes (*Neotermes*) *lagunensis* sp. nov. Plate 1, fig. 2; Plate 3,
figs. 1 and 2; Plate 4, fig. 1.

Imago.—Unknown.

Soldier.—Head reddish brown; anteclypeus yellowish white; labrum yellow; antennæ amber-colored; mandible black-brown, proximal part becoming paler; pronotum yellowish; abdomen milk-white. Head sparingly pilose; sternites and abdominal tergites roughly covered with spiny hairs.

Head cylindrical, sides nearly straight and parallel, posterior border rounded; forehead gradually inclined anteriorly; antennæ 15-jointed, first joint cylindrical, exceedingly large, second joint shorter than third, fourth joint as long as second, other joints ovoid, subequal in length; no rudimental eyes; fontanelle not present; anteclypeus trapezoidal, nearly one-fourth as long as broad; postclypeus not separated from forehead, with a series of spiny hairs along its anterior border; labrum tongue-shaped, slightly longer than broad, with a small number of long hairs at the tip; mandibles rather stout, with piercing incurved tip; right mandible with two triangular teeth, subequal in size, left mandible with six teeth, apical two subequal, sharply pointed, third exceedingly low, fourth molarlike, its cutting surface concave, fifth broad and low, the last one triangular, sharply pointed; pronotum as broad as head, subreniform, anterior border nearly straight, posterior border obscurely bilobed, sides converging posteriorly; mesonotum much narrower than pronotum; metanotum a little larger than mesonotum.

	mm.
Length of body	9.00–11.00
Length of head, with mandibles	3.93– 4.53
Length of head, without mandibles	2.67– 3.20
Width of head	2.13– 2.40
Width of pronotum	2.13– 2.40
Length of pronotum	1.00– 1.13

Worker.—Head yellowish; thorax and abdomen milk-white. Head and sternites sparingly pilose; abdominal tergites with two transverse series of spiny hairs.

Head spherical; anterolateral corners of postclypeus brown; antennæ 15-jointed, second joint nearly as long as third, fourth joint ring-shaped, about half as long as third, fifth joint a little longer than fourth; pronotum nearly as broad as head, quadrilateral, anterior and posterior borders nearly straight, lateral borders slightly convex, not converging posteriorly, posterolateral corners broadly rounded; abdomen elongate.

	mm.
Length of body	10.00
Width of head	2.00
Width of pronotum	2.06

LUZON, Laguna Province, Paete, March 7, 1917; inhabiting an old palm stub.

COPTOTERMITINÆ

Genus COPTOTERMES Silvestri

Coptotermes travians (Haviland).

Termes travians HAVILAND, Journ. Linn. Soc. London 26 (1898) 391, pl. 23, figs. 19-22 (Singapore and Sarawak).

PANAY, Antique Province, Culasi, July 1, 1918; inhabiting a house-post and clothing. LUZON, Manila, Malate, May 20, 1917; from the inside of posts and floors of Mr. McGregor's house. On November 29, 1917, a vast number of nymphs, soldiers, and workers were also collected in the building of the Bureau of Science, at Malate, attacking a mass of papers.

Coptotermes formosanus Shiraki.

Coptotermes formosanus SHIRAKI, Trans. Ent. Soc. Japan 2 (1909) 239 (Formosa).

Soldier.—Head and labrum deep yellow, tip of labrum hyaline; antennæ somewhat paler; mandibles reddish brown; pronotum yellow; abdomen and legs straw-colored. Head and thorax sparingly pilose; abdominal tergites densely covered with short, spiny hairs.

Head suborbicular, somewhat elongate, sides slightly converging anteriorly; fontanelle distinct, orifice directed forward; clypeus trapezoidal, very short, distinction between anteclypeus and postclypeus obscure; labrum lancet-shaped, with a sharply pointed tip, reaching middle of mandibles; mandibles slender, saber-shaped, with incurved piercing tip, cutting edge smooth;

antennæ 15-jointed, basal joint cylindrical, second joint quadrate, longer than third, third joint the smallest, nearly half as long as fourth, fifth to fourteenth joints suborbicular, apical joint oval; pronotum subreniform, narrower than head, anterior and posterior borders bilobed, lateral borders rounded, converging posteriorly; mesonotum and metanotum oval, the former slightly narrower than pronotum while the latter is much broader.

	mm.
Length of body	4.80-5.50
Length of head, with mandibles	2.19-2.28
Length of head, without mandibles	1.41-1.44
Width of head	1.15-1.21
Width of pronotum	0.81-0.87
Length of pronotum	0.47

Worker.—Head, thorax, and abdomen milk-white, densely pilose.

Head spherical; antennæ 15-jointed, second joint longer than third, third joint ring-shaped, fourth joint a little shorter than second; clypeus more or less swollen; pronotum much narrower than head, semilunar, anterior border obscurely bilobed.

	mm.
Length of body	4.00
Width of head	1.19
Width of pronotum	0.85

LUZON, Manila, February 17, 1917.

Remarks.—The present species is the most serious pest to wooden structures and woodwork in Formosa. It is here recorded for the first time from the Philippine Islands.

RHINOTERMITINÆ

Genus RHINOTERMES Hagen

Rhinotermes (*Schedorhinotermes*) *tarakensis* Oshima. Plate 3, figs. 7 and 8; Plate 4, figs. 6 and 7.

Rhinotermes (*Schedorhinotermes*) *tarakensis* OSHIMA, Annot. Zool. Jap. 8 (1914) 564, pl. 10, fig. 2 (Tarakan, Dutch Borneo).

Imago.—Unknown.

Soldier (*the larger form*).—Head deeply yellow, labrum, antennæ, and labial palpi paler; mandibles light reddish brown; thorax, abdomen, and legs yellow. Head and thorax very sparingly pilose; abdominal tergites moderately covered with delicate hairs and spiny hairs.

Head suborbicular, sides very slightly converging anteriorly, posterior border broadly rounded; fontanelle distinct, directed

obliquely forward; a shallow longitudinal groove from fontanelle to tip of labrum; anteclypeus whitish, anterior border rounded; postclypeus trapezoidal, nearly as long as the former; labrum tongue-shaped, scarcely reaching tip of mandibles, tip hyaline, anterior border obscurely bilobed, densely provided with short hairs; antennæ 15-jointed, first joint cylindrical, second joint slightly shorter than third, quadrate, fourth joint orbicular, nearly as long as third, other joints spherical, subequal in length, apical joint oval; mandibles rather short, with strongly incurved, piercing tip, the left with two sharply pointed teeth, subequal in size, the right with one strong tooth, acutely pointed; pronotum much narrower than head, inverted-heart-shaped, anterior border convex, posterior border weakly incurved at middle, sides rounded; mesonotum slightly narrower than pronotum; metanotum as broad as pronotum, ovoid, much shorter than mesonotum; abdomen rather short; styli one-jointed; hind legs reaching beyond the tip of abdomen.

	mm.
Length of body	3.50
Length of head, with mandibles	1.81-2.00
Length of head, without mandibles	1.18-1.28
Width of head	1.21-1.28
Width of pronotum	0.64-0.70
Length of pronotum	0.43-0.46

Soldier (the smaller form).—

	mm.
Length of body	3.00
Length of head, with mandibles	1.25
Length of head, without mandibles	0.69-0.75
Width of head	0.69-0.72
Width of pronotum	0.43-0.46
Length of pronotum	0.31-0.34

Worker.—

	mm.
Length of body	3.50-4.20
Width of head	1.18-1.25
Width of pronotum	0.53-0.56

LUZON, Laguna Province, San Antonio near Paete, March 12, 1917; discovered under a hard, round, black nest.

Remarks.—There is no previous record of the occurrence of the present species in the Philippine Islands, and the larger form of soldier is here described for the first time.

Rhinotermes (Schedorhinotermes) longirostris (Brauer).

Termes longirostris BRAUER, Reise Novara, Neur (1865) 47 (Iles Nicobar).

LUZON, Laguna Province, Paete, March 6, 1917; a vast number of soldiers (both forms) and workers.

Remarks.—Tunnels in a much decayed log.

Rhinotermes (Schedorhinotermes) bidentatus sp. nov. Plate 2, figs. 1 and 2; Plate 3, figs. 9, 10, 13, 14.

Imago.—Unknown.

Soldier (the larger form).—Head dark yellow; antennæ, labial palpi, and labrum somewhat paler; anteclypeus whitish; mandibles reddish brown; pronotum and abdomen yellow. Head and sternites very sparingly provided with spiny hairs; abdominal tergites with a series of delicate hairs along the posterior border, a few scattered spiny hairs.

Head quadrate, sides slightly converging anteriorly, posterior border broadly rounded; fontanelle distinct, directed obliquely forward, situated between roots of antennæ; a shallow groove from fontanelle to tip of labrum, slightly widened anteriorly; clypeus nearly half as long as broad, anterior border rounded, boundary between anteclypeus and postclypeus indistinct; labrum tongue-shaped, anterior border straight, middle part of lateral border swollen; antennæ 16-jointed, basal joint cylindrical, second joint much shorter than third, fourth joint slightly shorter than second, nearly half as long as third, other joints spherical, subequal in length; mandibles rather short, with strongly incurved, piercing tip, the left with two triangular teeth, second tooth much smaller than the other, the right with two sharply pointed subequal teeth directed forward; pronotum narrower than head, subreniform, anterior border convex, posterior border slightly incurved at middle, sides converging posteriorly; mesonotum a little narrower than pronotum; metanotum nearly as broad as mesonotum, posterior border straight; abdomen ovoid; styli 2-jointed; hind legs reaching beyond tip of abdomen.

	mm.
Length of body	6.00–7.00
Length of head, with mandibles	3.00
Length of head, without mandibles	2.00
Width of head	1.86–1.93
Width of pronotum	1.26–1.33
Length of pronotum	0.67

Soldier (the smaller form).—Head dark yellow, antennæ, labrum, and clypeus somewhat paler; anteclypeus whitish; mandibles yellowish brown; thorax, abdomen, and legs yellow. Head,

thorax, and abdominal tergites very sparingly provided with spiny hairs.

Head suborbicular, posterior border broadly rounded; fontanelle distinct, directed obliquely forward; a shallow longitudinal groove from fontanelle to tip of labrum, gradually widening anteriorly; clypeus semilunar, anterior margin rounded, anteclypeus obscurely separated from postclypeus; labrum elongate, extending beyond tip of mandibles, sides nearly parallel, tip distinctly bilobed, anterior margin of each lobe provided with a cluster of short, thick hairs; antennæ 16-jointed, basal joint cylindrical, rather short, second joint quadrate, nearly as long as third, fourth joint the shortest, more than half as long as third, fifth to fifteenth joints spherical, apical joint oval; mandibles slender, with sharply pointed, incurved tip, the left with two acutely pointed teeth, directed forward, second tooth smaller, the right with one tooth, sharply pointed; pronotum narrower than head, anterior border convex, posterior border weakly curved at middle, sides converging posteriorly; mesonotum oval, nearly as broad as pronotum; metanotum slightly broader than mesonotum; abdomen slender, hind legs exceeding its tip.

	mm.
Length of body	4.80-5.20
Length of head, with mandibles	1.87
Length of head, without mandibles	1.09
Width of head	1.00
Width of pronotum	0.81
Length of pronotum	0.50

Worker.—Head pale yellow; thorax and abdomen whitish; anterolateral corners of forehead brown. Head, thorax, and abdominal tergites moderately pilose.

Head quadrate, posterior border broadly rounded; clypeus swollen; antennæ 17-jointed, third joint smallest, half as long as second, fourth and fifth joints subequal; pronotum much narrower than head, more than twice as broad as long, anterior border raised, not bilobed, sides converging posteriorly, posterior border nearly straight, anterolateral corners acutely rounded; abdomen ovoid.

	mm.
Length of body	4.20-5.50
Width of head	1.40
Width of pronotum	0.75

PANAY, Antique Province, Culasi, May 18, 1918.

Remarks.—In a decayed log in forest.

TERMITOGETONINÆ

Genus *TERMITOGETONELLA* novum

Type of genus, *Termitogetonella tibiaoensis* sp. nov.

Termitogetonella tibiaoensis sp. nov. Plate 1, fig. 3; Plate 3, figs. 3 to 6; Plate 4, figs. 2 to 5.

Imago.—Head chestnut brown; postclypeus and antennæ yellowish; anteclypeus whitish; pronotum and abdomen yellowish brown. Head and thorax sparingly pilose, beset with a few spiny hairs; abdominal tergite with two series of spiny hairs along its posterior border, the anterior series composed of much longer hairs.

Head round; fontanelle small, distinct; postclypeus swollen, more than twice as long as anteclypeus; anteclypeus trapezoidal, very short, anterior border straight; labrum tongue-shaped; antennæ 17-jointed, basal joint cylindrical, second joint quadrilateral, much longer than third, fourth joint shorter than third, other joints spherical, subequal in size, apical joint oval; eye moderate, prominent; ocellus oval, approximated to eye; pronotum subreniform, anterior border obscurely bilobed, posterior border nearly straight, sides broadly rounded; mesonotum and metanotum subequal, narrower than pronotum; anterior wing stumps much larger than posterior, covering basal half of the latter; wings hyaline, costal and radius yellowish brown; radius of anterior wing near and parallel to costal, with no branch, median nerve originates from cubitus at the point of basal one-third, connected with the radius by irregular vertical nerves, cubitus runs above the middle of wing, giving off about fifteen branches, most of them connected with each other by short nerves; median nerve of posterior wing originates from radius, running nearer to cubitus than to radius; styli 1-jointed, slender.

	mm.
Length of body, with wings	11.00
Length of body, without wings	6.50
Length of head	1.25
Width of head	1.38
Width of pronotum	1.44
Length of pronotum	0.94
Length of anterior wing	8.50

Soldier.—Head brownish yellow, antennæ and labial palpi paler; mandibles reddish brown, darker anteriorly; pronotum yellow; abdomen and legs straw-colored. Head very coarsely covered with spiny hairs; thorax and abdominal tergites mod-

erately pilose, the latter with a series of spiny hairs along the posterior border.

Head oval; fontanelle obscure; clypeus trapezoidal, indistinctly separated from forehead, not divided into two parts, anterior border straight; labrum tongue-shaped, obtusely pointed anteriorly, tip not reaching the middle of mandibles, provided with a few spiny hairs; mandibles saber-shaped, with incurved and upcurved piercing tip, the left with a sharply pointed tooth at middle of cutting margin, the right nearly smooth with a very low weak tooth; antennæ 17-jointed, basal joint enlarged, cylindrical, second joint elongate, nearly twice as long as third which is the smallest, fourth joint slightly longer than third, subequal to fifth, other joints quadrate, apical one oval; pronotum saddle-shaped, much narrower than head, anterior border bilobed, posterior border weakly incurved at middle, sides strongly converging posteriorly; mesonotum subreniform, narrower than pronotum; metanotum oval, nearly as broad as pronotum; abdomen rather short; styli 1-jointed, hind legs reaching beyond tip of abdomen.

	mm.
Length of body	5.50-7.00
Length of head, with mandibles	3.13-3.24
Length of head, without mandibles	2.08-2.25
Width of head	1.59-1.77
Width of pronotum	1.15-1.29
Length of pronotum	0.69-0.72

Worker.—Head yellow, antennæ and postclypeus somewhat paler; anteclypeus whitish; thorax and abdomen yellowish white. Head nearly smooth, with a few short spiny hairs; thorax and abdomen sparingly pilose.

Head quadrate, shorter than broad, posterior border broadly rounded; postclypeus swollen, trapezoidal; anteclypeus much narrower and shorter than the former, anterior border straight; antennæ 13-jointed, second joint nearly as long as third, fourth joint narrow, half as long as third; pronotum semi-lunar, anterior and posterior borders straight, sides converging posteriorly.

	mm.
Length of body	4.20-5.00
Width of head	1.15-1.44
Width of pronotum	0.94-1.19

PANAY, Antique Province, Tibiao, May 9, 1918; Culasi, May 16, 1918.

Remarks.—Found in an old log.

METATERMITIDÆ

Termes (Macrotermes) philippinensis Oshima.

Termes (Macrotermes) philippinensis OSHIMA, Annot. Zool. Jap. 8 (1914) 566 (Los Baños).

Locality.—LUZON, Manila, Malate, 1918 (*W. H. Brown*); San Juan del Monte, June 10, 1917: Bulacan Province, Polo, May 30, 1917: Laguna Province, Paete, March 6, 1917; Pañgil, March 25, 1917 (*McGregor*). PANAY, Antique Province, Culasi, May 26, 1918 (*McGregor*).

Remarks.—The present species builds a large earth mound on the ground, connected with the subterranean nest. Winged forms swarm at the end of June. The specimens from Malate, Manila, were taken from the mound figured by Brown.¹

Termes (Macrotermes) luzonensis Oshima.

Termes (Macrotermes) luzonensis Oshima, Annot. Zool. Jap. 8 (1914) 569, pl. 9, figs. 10 and 11 (Los Baños).

LUZON, Laguna Province, Pañgil, a large queen, collected on March 25, 1917; Paete, March 10, 1917: San Francisco del Monte near Manila, June 14, 1917.

Remarks.—This species builds a large earth mound. Mr. McGregor found its tunnels on *Artocarpus integrifolia*.

Termes (Macrotermes) manilanus Oshima.

Termes (Macrotermes) manilanus OSHIMA, Annot. Zool. Jap. 8 (1914) 565 (Manila).

Soldiers and workers are still unknown.

PANAY, Antique Province, Lipata near Culasi, July 31, 1918, at night at a lighted lantern on the beach. LUZON, Manila, June 5, 1917.

Termes (Macrotermes) copelandi Oshima.

Termes (Macrotermes) copelandi OSHIMA, Annot. Zool. Jap. 8 (1914) 570, pl. 9, figs. 6 and 7 (Los Baños).

LUZON, Manila, Santa Mesa, Calle Buena Vista, May 27, 1917; San Francisco del Monte, January 14 and February 22, 1917; San Juan del Monte, June 10, 1917; Montalban, February 22, 1918; Antipolo, November 11, 1917. PANAY, Capiz Province, Ibajay, August 9, 1918.

Remarks.—*Termes copelandi* is a species which builds large clay mounds on the ground. Its earthen runways are often found on bamboo fences and on shrubs. According to Mr. Mc-

¹ Philip. Journ. Sci. 13 (1918) Bot. pl. 3.

Gregor's information, it attacks *Eugenia jambolana* and *Leucaena glauca*, making large tunnels on their twigs.

Genus ODONTOTERMES Holmgren

Odontotermes mediodontatus sp. nov. Plate 1, fig. 4; Plate 3, figs. 11 and 12; Plate 4, figs. 8 and 9.

Imago.—Unknown.

Soldier.—Head reddish yellow; antennæ and labial palpi yellow; mandibles dark reddish brown, proximal parts much paler; thorax, abdomen, and legs yellowish. Head sparingly pilose; thorax and abdominal tergites moderately covered with hairs, the latter with a series of short spiny hairs along the posterior borders.

Head ovoid, sides very slightly converging anteriorly, posterior border rounded; no fontanelle; clypeus quadrilateral, not divided into two parts, posteriorly not separated from forehead, anterior border straight; labrum rather short, tongue-shaped, tip obtusely pointed, not reaching middle of mandibles, with no hyaline portion; mandibles rather slender, with incurved piercing tip, the left with two triangular teeth, one at the center, the other at the proximal part, cutting margin of the right smooth; antennæ 16-jointed, first joint cylindrical, exceedingly large, second joint longer than broad, nearly twice as long as third, fourth joint slightly longer than third, fifth joint subequal to third, other joints inverted-cone-shaped, apical joint oval; pronotum saddle-shaped, narrower than head, anterior border entire, posterior border weakly incurved at middle; mesonotum slightly narrower than pronotum, posterior border bilobed; metanotum broader than pronotum, posterior border straight; abdomen rather short; styli 1-jointed.

	mm.
Length of body	5.00-6.00
Length of head, with mandibles	2.56-2.71
Length of head, without mandibles	1.65-1.87
Width of head	1.38-1.50
Width of pronotum	0.97-1.03
Length of pronotum	0.59-0.63

Worker.—Head yellow, antennæ and labial palpi somewhat paler; thorax and abdomen yellowish white. Head densely covered with delicate hairs; thorax and abdominal tergites moderately pilose.

Head orbicular, posterior border rounded, sides very slightly diverging anteriorly; Y-suture not present; postclypeus swollen,

anterior border of anteclypeus broadly rounded; antennæ 17-jointed, first joint elongate, cylindrical, second joint more than twice as long as third which is the smallest, fourth joint shorter than second; pronotum saddle-shaped, much narrower than head, anterior border entire.

	mm.
Length of body	3.50-4.00
Width of head	1.35
Width of pronotum	0.69

LUZON, Laguna, Paete, March 6, 1917.

Remarks.—The present species is very closely related to *Odonotermes denticulatus*, from Singapore. It differs from the latter in having the head and thorax a little larger in the case of the soldier.

Genus EUTERMES Müller

Eutermes (*Hospitalitermes*) *hospitalis* (Haviland). Plate 3, fig. 19; Plate 4, fig. 12.

Termes hospitalis HAVILAND, Journ. Linn. Soc. London 26 (1898) 437, pl. 25, figs. 83-86 (Sarawak and Singapore).

Soldier.—Head, thorax, and abdomen dark castaneous, tip of rostrum somewhat paler; antennæ uniformly yellowish brown; coxa, trochanter, and femur isabelline, tibia and tarsus amber-colored. Head and thorax hairless; anterior border of pronotum provided with a series of short hairs; abdominal tergites sparingly beset with microscopic hairs.

Head pear-shaped, sides somewhat constricted in front; rostrum slender, its upper surface making a marked curve with that of head; antennæ 14-jointed, third joint more than twice as long as second, fourth joint slightly shorter than third, fifth to ninth joints elongate, subequal in length; other joints gradually decreasing in length, inverted-cone-shaped, apical joint oval; mandibles with slender, pointed apical portion; pronotum saddle-shaped, anterior border elevated, not bilobed; legs slender, exceedingly elongate.

	mm.
Length of body	4.50
Length of head, with rostrum	1.80-1.87
Length of head, without rostrum	1.25
Width of head	1.15-1.18
Width of pronotum	0.66

Worker (the larger form).—Head dark castaneous, thorax and abdomen somewhat paler; anteclypeus and labrum brownish yellow; antennæ and labial palpi uniformly isabelline; coxa,

trochanter, and femur yellowish brown, tibia and tarsus amber-colored. Head, thorax, and abdomen sparingly beset with microscopic hairs.

Head round, sides more or less converging anteriorly; Y-suture distinct, whitish; postclypeus swollen, its middle part depressed; anteclypeus short, with rounded anterior border; labrum tongue-shaped, antennæ 15-jointed, second joint much shorter than third, fourth joint shorter than third, but slightly longer than second, other joints elongate, subequal in length, apical joint oval, rather short; pronotum saddle-shaped, anterior border obscurely bilobed.

	mm.
Length of body	4.50–5.20
Width of head	1.12–1.15
Width of pronotum	0.75–0.78

Worker (the smaller form).—Color and hairiness as in the former; antennæ 15-jointed, second to fourth joints subequal in length.

	mm.
Length of body	3.80–4.20
Width of head	1.00
Width of pronotum	0.62

LUZON, San Francisco del Monte near Manila, January 14, 1917.

Remarks.—The present species distinctly differs from *Eutermes (H.) luzonensis* Oshima, which was formerly described under the name of *Eutermes (H.) hospitalis*.²

Eutermes (Ceylonitermes) mcgregori Oshima.

Eutermes (Ceylonitermes) mcgregori OSHIMA, Philip. Journ. Sci. § D 11 (1916) 361, pl. 1, fig. 19 (Sarai).

Locality.—PANAY, Antique Province, Tibiao; May 14, 1918, found in decayed wood.

Eutermes (Eutermes) gracilis Oshima.

Eutermes (Eutermes) gracilis OSHIMA, Philip. Journ. Sci. § D 11 (1916) 362, pl. 1, fig. 9, pl. 2, figs. 4 and 5 (Sarai).

Locality.—LUZON, Laguna Province, Paete, March 10, 1917.

Remarks.—Tunnels built by the present species were found on a palm, *Areca catechu*.

² Philip. Journ. Sci. § D 11 (1916) 360.

Eutermes (*Eutermes*) *balintauacensis* Oshima. Plate 3, fig. 17; Plate 4, fig. 16.

Eutermes (*Eutermes*) *balintauacensis* OSHIMA, Philip. Journ. Sci. § D 12 (1917) 224 (Balintauac).

Locality.—LUZON, Laguna Province, Paete, March 10, 1917, from old decayed wood.

Eutermes (*Eutermes*) *castaneus* sp. nov. Plate 2, fig. 4; Plate 3, fig. 18; Plate 4, fig. 15.

Imago.—Unknown.

Soldier.—Head brownish yellow, rostrum somewhat darker, antennæ dark yellow; thorax and abdomen pale chestnut-colored; labial palpi and legs straw-colored. Head and thorax sparingly provided with long spiny hairs; abdominal tergites densely pilose, long spiny hairs intermingled with minute ones.

Head broadly oval, sides strongly converging anteriorly, dorsal profile not straight, with a swelling at the junction of rostrum; rostrum rather long, slender, its upper surface on the same plane as that of the head; mandibles with more or less developed apical portion; antennæ 13-jointed, basal joint much enlarged, third joint elongate, nearly twice as long as fourth, second joint slightly longer than fourth, other joints inverted-cone-shaped, apical joint oval; pronotum saddle-shaped, anterior border rounded.

	mm.
Length of body	3.00–3.20
Length of head, with rostrum	1.47–1.59
Length of head, without rostrum	0.81–0.84
Width of head	0.81–0.84
Width of pronotum	0.44–0.47

Worker.—Head yellow; antennæ and labial palpi much paler; thorax and abdomen yellowish white. Head, thorax, and abdominal tergites densely covered with short hairs.

Head quadrate, posterior border broadly rounded; Y-suture obscure; postclypeus more or less swollen, much shorter than half its width; anteclypeus longer than the former, obtusely pointed anteriorly; antennæ 14-jointed, second joint much longer than third, fourth joint the smallest, ring-shaped, nearly half as long as third; pronotum saddle-shaped, anterior border rounded.

	mm.
Length of body	4.00–4.20
Length of head	1.09
Width of pronotum	0.59

LUZON, Laguna Province, Sarai near Paete, March 19, 1917.
PANAY, Antique Province, Culasi, June 13, 1918.

Remarks.—The present species is very closely allied to *Eutermes gracilis*, from Sarai. The soldier of the latter has a wider head and a longer fourth antennal joint.

Eutermes (*Eutermes*) *las-piñasensis* sp. nov. Plate 2, fig. 3; Plate 4, fig. 13.

Imago.—Unknown.

Soldier.—Head yellowish brown; tip of rostrum reddish brown; pronotum brownish; antennæ, abdomen, and legs dark yellow. Head nearly smooth, with a few long spiny hairs; thorax smooth; abdominal tergites beset with microscopic hairs, posterior ones with a small number of long spiny hairs.

Head round, sides converging anteriorly, dorsal profile nearly straight, making a very weak curve; rostrum rather short, conical; mandible with a short, pointed apical portion; antennæ 13-jointed; second joint a little longer than fourth, third joint the longest, much longer than second; pronotum saddle-shaped, anterior border rounded.

	mm.
Length of body	3.20–3.80
Length of head, with rostrum	1.59–1.62
Length of head, without rostrum	0.94–1.00
Width of head	0.94–1.00
Width of pronotum	0.47–0.50

Worker.—Head dark brown; anteclypeus yellowish; thorax and abdomen yellowish white; antennæ and legs dark yellow. Head moderately pilose; thorax nearly smooth, pronotum with a series of short hairs along the anterior border; abdominal tergites beset with minute hairs.

Head round, Y-suture distinct, whitish; postclypeus more or less swollen, much shorter than half the width; antennæ 14-jointed, third joint elongate, very slightly longer than second, fourth joint the smallest, nearly half as long as third; pronotum saddle-shaped, anterior border obscurely bilobed.

	mm.
Length of body	4.00
Width of head	1.19–1.22
Width of pronotum	0.59–0.69

LUZON, Paco, April 30, 1917: Rizal Province, Las Piñas, May 6 and 20, 1917: Laguna Province, Sarai, March 19, 1917: Bulacan Province, north of Polo, May 30, 1917.

Remarks.—Very closely allied to *Eutermes buitenzorgi* Holmgren, from Java. The soldier of the present species differs from that of the former in having a longer head.

A nest was found at the base of a small *Pithecolobium dulce*. It was actually observed that *Eutermes las-piñasensis* attacks *Barringtonia* and the above-mentioned tree, making wide-covered tunnels over the trunks.

Eutermes (*Trinervitermes*) *menadoensis* Oshima.

Eutermes (*Trinervitermes*) *menadoensis* OSHIMA, Annot. Zool. Jap. 8 (1914) 580, pl. 10, figs. 9 and 10 (Menado, Celebes).

LUZON, San Francisco del Monte, February 22, 1917; Masambuang, near Manila, February 22, 1917; Laguna Province, Paete, March 10, 1917.

Remarks.—The present species sometimes attacks *Ficus* and *Barringtonia*, making covered tunnels from nests in the ground.

Eutermes (*Rotunditermes*) *culasiensis* sp. nov. Plate 2, fig. 6; Plate 3, fig. 20; Plate 4, fig. 14.

Imago.—Unknown.

Soldier.—Head, antennæ, and labial palpi yellow; rostrum reddish brown, paler posteriorly; pronotum yellowish, with brownish anterior border; abdomen white; legs straw-colored. Head very sparingly beset with spiny hairs; thorax roughly pilose; abdominal tergites covered with minute hairs.

Head turnip-shaped, with a slender conical rostrum, dorsal profile nearly straight, making a curve; antennæ 12-jointed, second joint nearly as long as third, fourth joint slightly longer than third, other joints subequal in length; mandible with a short apical portion which is sharply pointed; pronotum saddle-shaped, anterior border entire, not bilobed.

	mm.
Length of body	3.20–3.80
Length of head, with rostrum	1.44–1.50
Length of head, without rostrum	0.85–0.94
Width of head	0.94–0.97
Width of pronotum	0.44–0.47

Worker.—Head yellow; antennæ, labial palpi, and thorax straw-colored; abdomen whitish. Head sparingly pilose; thorax and abdominal tergites moderately covered with minute hairs.

Head quadrate, posterior border broadly rounded; Y-suture distinct, whitish; postclypeus swollen, nearly twice as broad as

long; anteclypeus short, obtusely pointed anteriorly; antennæ 13-jointed, second joint longer than fourth, third joint the smallest, shorter and narrower than fourth; pronotum saddle-shaped, anterior border distinctly bilobed.

	mm.
Length of body	4.20
Width of head	1.00
Width of pronotum	0.60

PANAY, Antique Province, Culasi, May 16, 1918, found in the bark of a decayed log.

Eutermes (Grallatotermes) luzonicus Oshima.

Eutermes (Grallatotermes) luzonicus OSHIMA, Annot. Zool. Jap. 8 (1914) 581, pl. 10, figs. 15 and 16 (Los Baños).

LUZON, San Juan del Monte near Manila, June 10, 1917: Rizal Province, Las Piñas, May 6, 1917: Laguna Province, Paete, March 4, 1917. PANAY, Antique Province, Tibiao, May 4, 1918: Capiz Province, Ibajay, August 9, 1918.

Remarks.—The present species attacks *Pithecolobium dulce*, *Spondias purpurea*, bamboos, and cocos. Very often it enters houses, attacking wooden parts.

Eutermes (Grallatotermes) panayensis sp. nov. Plate 2, fig. 5.

Imago.—Unknown.

Soldier (the larger form).—Head and abdominal tergites dark brown, thorax somewhat paler; rostrum reddish brown; antennæ and legs dark yellow. Head and thorax beset with a small number of long spiny hairs; abdominal tergites moderately covered with microscopic hairs, long spiny hairs intermingled with them.

Head round, dorsal profile weakly incurved at the junction of rostrum; rostrum rather short, cone-shaped; mandible with a short apical portion, sharply pointed; antennæ 13-jointed, second joint slightly longer than fourth, third joint the longest, much longer than second, other joints ovoid, elongate, subequal in length; pronotum saddle-shaped, anterior border rounded.

	mm.
Length of body	4.50
Length of head, with rostrum	1.59–1.62
Length of head, without rostrum	1.03–1.06
Width of head	0.94–0.97
Width of pronotum	0.60

Soldier (the smaller form).—Head and rostrum uniformly reddish brown; thorax yellowish brown; abdominal tergites

chestnut-colored; antennæ and legs yellow. Head and thorax with a small number of long, spiny hairs; abdominal tergites densely covered with microscopic hairs, with a series of long, spiny hairs along their posterior borders.

Head pear-shaped, sides converging anteriorly, dorsal profile nearly straight, with a weak swelling at the junction of rostrum; rostrum rather slender, conical; antennæ 13-jointed, second joint slightly longer than fourth, third joint the longest, much longer than second; pronotum saddle-shaped, anterior border rounded.

	mm.
Length of body	3.00-3.80
Length of head, with rostrum	1.41-1.53
Length of head, without rostrum	0.88-0.94
Width of head	0.78-0.88
Width of pronotum	0.44

Worker.—Head and abdominal tergites dark brown; thorax yellowish brown; antennæ and legs dark yellow. Head pilose, long spiny hairs intermingled with microscopic ones; thorax nearly smooth, anterior border of pronotum provided with a series of short hairs; abdominal tergites moderately covered with minute hairs.

Head round, Y-suture distinct; forehead inclined anteriorly, postclypeus swollen, shorter than half the width; anteclypeus obtusely pointed anteriorly; antennæ 14-jointed, second nearly as long as third, fourth joint much shorter than third; pronotum saddle-shaped, anterior border rounded.

	mm.
Length of body	4.20-4.50
Width of head	1.06-1.09
Width of pronotum	0.60-0.66

PANAY, Antique Province, Culasi, July 16, 1918; tunnels on a large tree.

Genus *CAPRITERMES* Wasmann

Capritermes paetensis sp. nov. Plate 2, figs. 7 and 8; Plate 3, figs. 15 and 16; Plate 4, figs. 10 and 11.

Imago.—Unknown.

Soldier.—Head brownish yellow, darker anteriorly, antennæ, labial palpi, and labrum somewhat paler; mandibles dark reddish brown, the left much darker; pronotum dark yellow, mesonotum and metanotum paler; abdomen and legs straw-colored. Head and thorax sparingly provided with spiny hairs; abdominal tergites with two transverse series of spiny hairs, interspace of which is roughly covered with minute hairs.

Head cylindrical, sides very slightly converging anteriorly, posterior border rounded; forehead abruptly inclined, more or less concave, with a shallow median groove; the vertical part of Y-suture deeply colored; fontanelle small; antennæ 14-jointed, basal joint cylindrical, exceedingly large, second joint quadrilateral, slightly shorter than third, fourth joint the shortest, much shorter than second, fifth to thirteenth joints elongate, club-shaped; anteclypeus quadrate, nearly as long as broad; postclypeus considerably shorter than the former, distinctly separated from forehead; labrum short, asymmetrical, much enlarged anteriorly, anterior border nearly straight, provided with a few long hairs, left anterolateral corner sharply pointed, the right obtusely rounded; mandibles asymmetrical, the right shorter and straighter, with an outcurved piercing tip, the left much bent, S-shaped, the basal third directed inward, the outer margin becoming gradually the upper, the middle third bending quickly outward, the apical third directed forward, the upper margin becoming again the outer, the tip obtusely pointed; gula elongate, narrow, much enlarged anteriorly, lateral borders concave; pronotum saddle-shaped, much narrower than head, anterior border rounded, posterior border obscurely bilobed; mesonotum narrower than pronotum, metanotum nearly as broad as pronotum; styli 1-jointed; hind legs slender, reaching beyond tip of abdomen.

	mm.
Length of body	5.50-6.00
Length of head, with mandibles	4.00-4.20
Length of head, without mandibles	2.20-2.30
Width of head	1.20
Width of pronotum	0.75-0.87

Worker.—Head yellow, antennæ somewhat paler; abdomen milk-white. Head sparingly pilose; abdominal tergites moderately covered with minute hairs.

Head spherical, Y-suture and fontanelle obscure; antennæ 14-jointed, second and third joints subequal in length, slightly shorter than fifth, fourth joint the smallest, nearly half as long as fifth; pronotum much narrower than head, saddle-shaped, anterior border rounded.

	mm.
Length of body	4.50
Width of head	1.00
Width of pronotum	0.56

LUZON, Laguna Province, Paete, March 10, 1917; in damp ground under vegetable waste.

Remarks.—The nearest relative of the present species is *Capritermes distinctus*, from Ceylon. The soldier of the latter is smaller and is provided with a broader pronotum and with shorter mandibles. Its worker is also smaller than that of *C. paetensis*, measuring 2.7 to 2.8 millimeters.

Genus **MICROCEROTERMES** Wasmann

Microcerotermes los-banosensis Oshima.

Microcerotermes los-banosensis OSHIMA, Annot. Zool. Jap. 8 (1914) 583, pl. 10, fig. 6 (Los Baños).

Imago.—Head and pronotum chestnut brown; clypeus, labrum, and antennæ yellowish brown; abdomen dark brown; legs dark yellow. Head moderately pilose, covered with delicate hairs and a small number of spiny hairs; pronotum and wing stumps beset with strong spiny hairs; mesonotum and metanotum covered with minute hairs; abdominal tergites densely covered with delicate hairs.

Head round, no fontanelle; anteclypeus whitish, much shorter than postclypeus, anterior border obtusely pointed; postclypeus swollen, nearly half as long as broad; labrum tongue-shaped, broader than long; eye moderate, slightly prominent; ocellus round, the distance from eye less than twice its diameter; antennæ 14-jointed, basal joint cylindrical, much enlarged, second joint quadrilateral, twice as long as third which is the smallest, fourth joint slightly shorter than second, other joints spherical, subequal in length, apical joint oval; pronotum narrower than head, subreniform, anterior border nearly straight, posterior border weakly indented at middle, sides converging posteriorly; mesonotum and metanotum subequal, longer than pronotum, their posterior borders strongly indented at the middle; anterior wing stumps larger than posterior, not covering the base of the latter; wings brownish, coarsely beset with short, spiny hairs; radius nerve of anterior wing nearly straight, not branched, running near and parallel to costal margin, median nerve nearer to cubitus than to radius, bifurcated at tip, cubitus with seven branches, not reaching tip of wing, its root united to that of median nerve, dental nerve distinct; median nerve of posterior wing originates from the proximal part of radius; cubitus with eight branches; styli short; hind legs not reaching tip of abdomen.

	mm.
Length of body, with wings	8.00-9.00
Length of body, without wings	4.50-5.00
Length of head	0.85-0.91
Width of head	0.78-0.81
Width of pronotum	0.66-0.72
Length of pronotum	0.38-0.44

Ergatoid.—Head and pronotum chestnut brown; antennæ yellowish brown; wing pads and abdominal tergites chestnut brown, somewhat paler than head; legs and integument of abdomen dark yellow. Head moderately covered with delicate hairs; pronotum and wing pads sparingly pilose, abdominal tergites densely beset with minute hairs.

Head round; no fontanelle; anteclypeus nearly half as long as postclypeus, anterior border obtusely pointed; postclypeus swollen, twice as broad as long; labrum tongue-shaped; eye more or less prominent; ocellus yellowish, round, the distance to the eye less than twice as long as its diameter; antennæ 14-jointed, basal joint cylindrical, elongate, second joint longer than fourth, third joint ring-shaped, half as long as fourth, fifth joint quadrate, other joints ovoid, subequal in length; pronotum slightly narrower than head, semilunar, anterior border nearly straight, posterior border obscurely bilobed, sides rounded, converging posteriorly; mesonotum slightly longer than pronotum, posterior border straight; metanotum as long as pronotum, with straight posterior border; wing pads well-developed, produced posteriorly, tip of the anterior pair reaching beyond posterior border of metanotum, posterior pair shorter than the anterior; abdomen enlarged, integument between abdominal tergites extended; styli rather short, 2-jointed.

	mm.
Length of body	6.00-10.00
Length of head	0.85
Width of head	0.85
Width of pronotum	0.75
Length of pronotum	0.47

Soldier.—

	mm.
Length of body	5.00-5.50
Length of head, with mandibles	2.44-2.66
Length of head, without mandibles	1.50-1.56
Width of head	1.00-1.03
Width of pronotum	0.63-0.69
Length of pronotum	0.32-0.35

Worker.—

	mm.
Length of body	4.00–4.50
Width of head	0.94–1.03
Width of pronotum	0.53–0.58

LUZON, Manila, Malate, December 31, 1916; San Francisco del Monte, February 22, 1917; Masambuang, January 14, 1917; Las Piñas, May 20, 1917; Guadalupe, January 6, 1917; Bulacan Province, Polo, May 31, 1917 (imagoes, soldiers, and workers); Laguna Province, San Antonio near Paete, March 13, 1917; Sarai near Paete, March 19, 1917. PANAY, Antique Province, Tibiao, May 9, 1918; Culasi, June 6, 1918; Batbatan Island, June 30, 1918. ROMBLON, August 13, 1918 (imagoes, soldiers, and workers).

Remarks.—The present species seems to be one of the commonest termites in the Philippine Islands. Occasionally it attacks *Pithecolobium dulce*, cocos, or bamboos, constructing small, hard nests at their bases or below the ground.

Among the individuals that were collected at Tibiao, on May 9, 1918, were sixteen grown-up ergatoids, together with a vast number of young larvæ and eggs.

ILLUSTRATIONS

PLATE 1

- FIG. 1. *Calotermes* (N.) *malatensis* Oshima, soldier.
2. *Calotermes* (N.) *lagunensis* sp. nov., soldier.
3. *Termitogetonella tibiaoensis* g. et sp. nov., soldier.
4. *Odontotermes mediodentatus* sp. nov., soldier.

PLATE 2

- FIG. 1. *Rhinotermes* (Sch.) *bidentatus* sp. nov., larger form of soldier.
2. *Rhinotermes* (Sch.) *bidentatus* sp. nov., smaller form of soldier.
3. *Eutermes* (E.) *las-piñasensis* sp. nov., soldier.
4. *Eutermes* (E.) *castaneus* sp. nov., soldier.
5. *Eutermes* (G.) *panayensis* sp. nov., soldier.
6. *Eutermes* (R.) *culasiensis* sp. nov., soldier.
7. *Capritermes paetensis* sp. nov., soldier.
8. *Capritermes paetensis* sp. nov., soldier's head.

PLATE 3

- FIG. 1. *Calotermes* (N.) *lagunensis* sp. nov., soldier's left mandible.
2. *Calotermes* (N.) *lagunensis* sp. nov., soldier's right mandible.
3. *Termitogetonella tibiaoensis* g. et sp. nov., imago's anterior wing.
4. *Termitogetonella tibiaoensis* g. et sp. nov., imago's posterior wing.
5. *Termitogetonella tibiaoensis* g. et sp. nov., soldier's left mandible.
6. *Termitogetonella tibiaoensis* g. et sp. nov., soldier's right mandible.
7. *Rhinotermes* (Sch.) *tarakensis* Oshima, soldier's left mandible
(larger form).
8. *Rhinotermes* (Sch.) *tarakensis* Oshima, soldier's right mandible
(larger form).
9. *Rhinotermes* (Sch.) *bidentatus* sp. nov., soldier's left mandible
* (smaller form).
10. *Rhinotermes* (Sch.) *bidentatus* sp. nov., soldier's right mandible
(smaller form).
11. *Odontotermes mediodentatus* sp. nov., soldier's left mandible.
12. *Odontotermes mediodentatus* sp. nov., soldier's right mandible.
13. *Rhinotermes* (Sch.) *bidentatus* sp. nov., soldier's left mandible.
14. *Rhinotermes* (Sch.) *bidentatus* sp. nov., soldier's right mandible.
15. *Capritermes paetensis* sp. nov., soldier's left mandible.
16. *Capritermes paetensis* sp. nov., soldier's right mandible.
17. *Eutermes* (E.) *balintauacensis* Oshima, soldier's mandible.
18. *Eutermes* (E.) *castaneus* sp. nov., soldier's mandible.
19. *Eutermes* (H.) *hospitalis* (Haviland), soldier's mandible.
20. *Eutermes* (R.) *culasiensis* sp. nov., soldier's mandible.

PLATE 4

- FIG. 1. *Calotermes* (N.) *lagunensis* sp. nov., soldier's antenna.
 2. *Termitogetonella tibiaoensis* g. et sp. nov., soldier's antenna.
 3. *Termitogetonella tibiaoensis* g. et sp. nov., imago's left mandible.
 4. *Termitogetonella tibiaoensis* g. et sp. nov., imago's right mandible.
 5. *Termitogetonella tibiaoensis* g. et sp. nov., soldier's labrum.
 6. *Rhinotermes* (Sch.) *tarakensis* Oshima, soldier's antenna (larger form).
 7. *Rhinotermes* (Sch.) *tarakensis* Oshima, soldier's labrum and clypeus (larger form).
 8. *Odontotermes mediodentatus* sp. nov., soldier's antenna.
 9. *Odontotermes mediodentatus* sp. nov., soldier's labrum.
 10. *Capritermes paetensis* sp. nov., soldier's antenna.
 11. *Capritermes paetensis* sp. nov., soldier's labrum.
 12. *Eutermes* (H.) *hospitalis* (Haviland), soldier's antenna.
 13. *Eutermes* (E.) *las-piñasensis* sp. nov., soldier's antenna.
 14. *Eutermes* (R.) *culasiensis* sp. nov., soldier's antenna.
 15. *Eutermes* (E.) *castaneus* sp. nov., soldier's antenna.
 16. *Eutermes* (E.) *balintauacensis* Oshima, soldier's antenna.

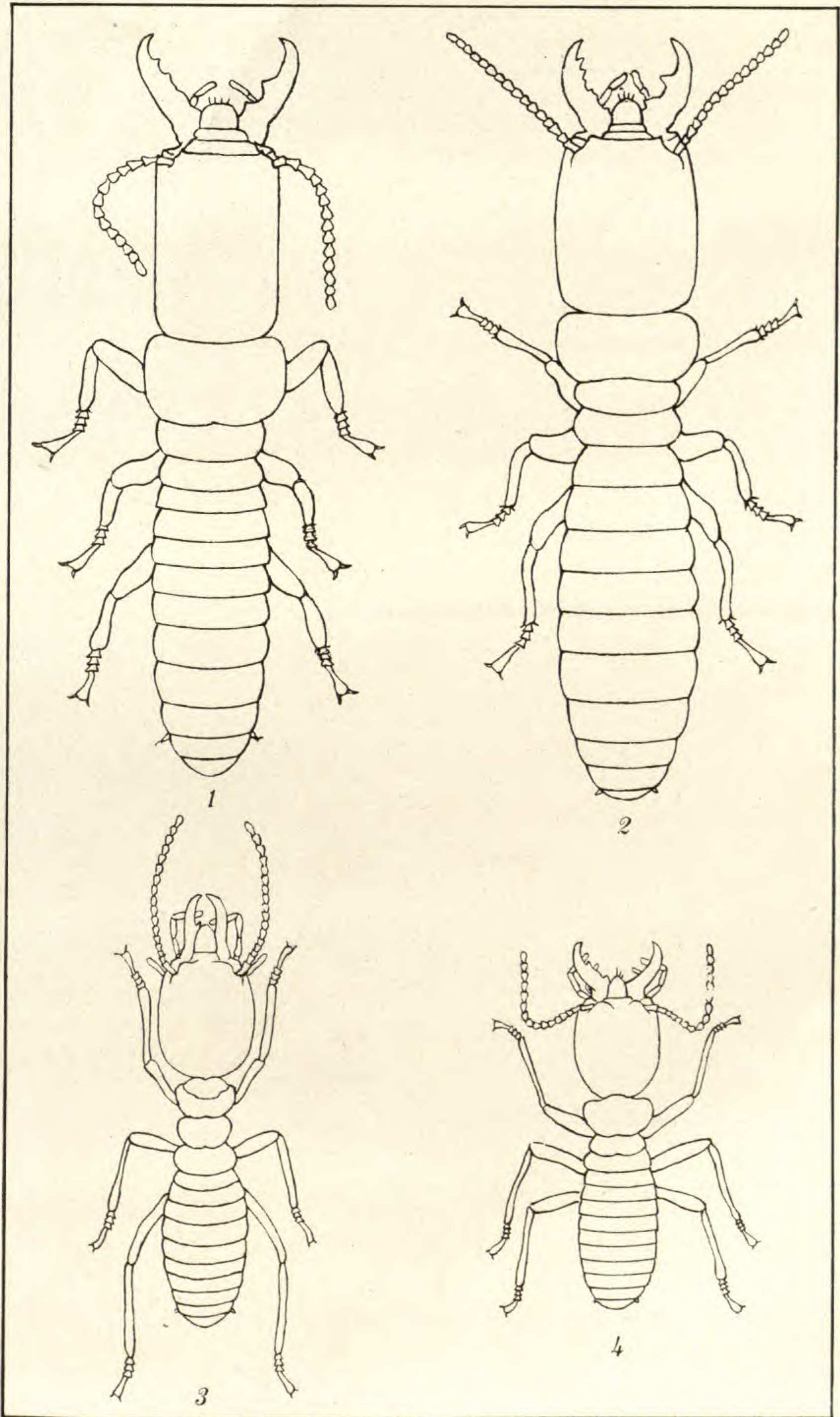


PLATE 1. PHILIPPINE TERMITES.

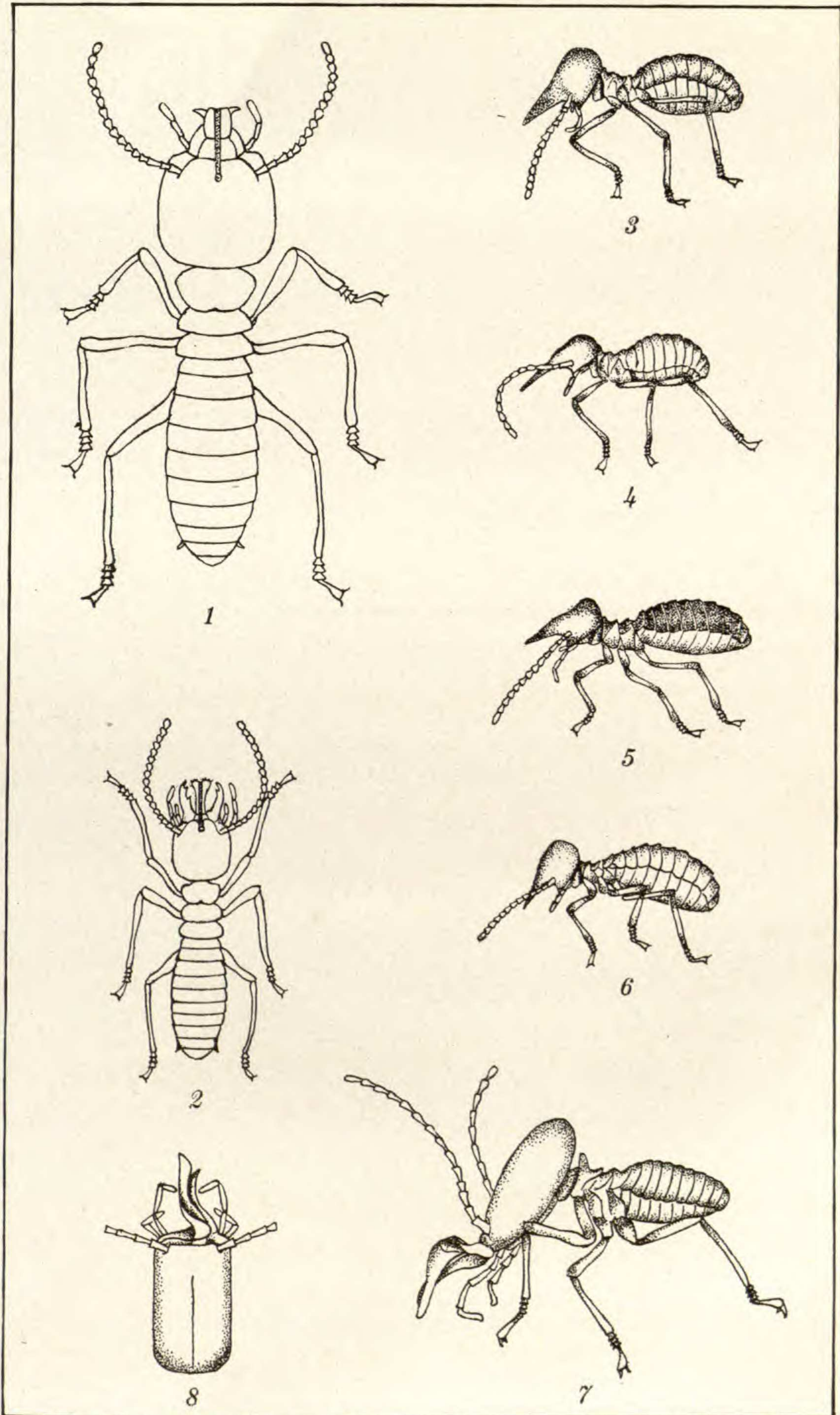


PLATE 2 PHILIPPINE TERMITES.

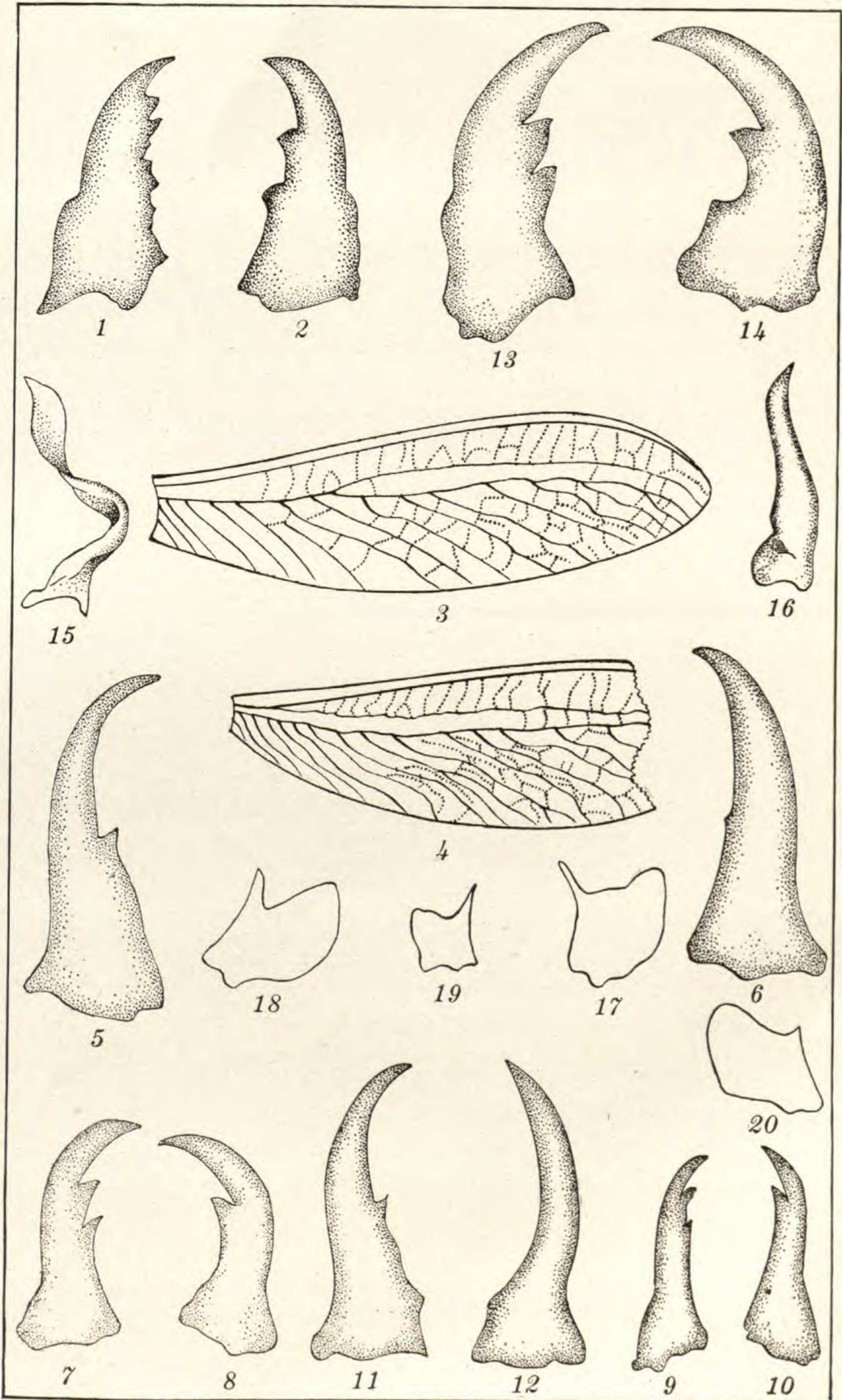


PLATE 3. PHILIPPINE TERMITES.

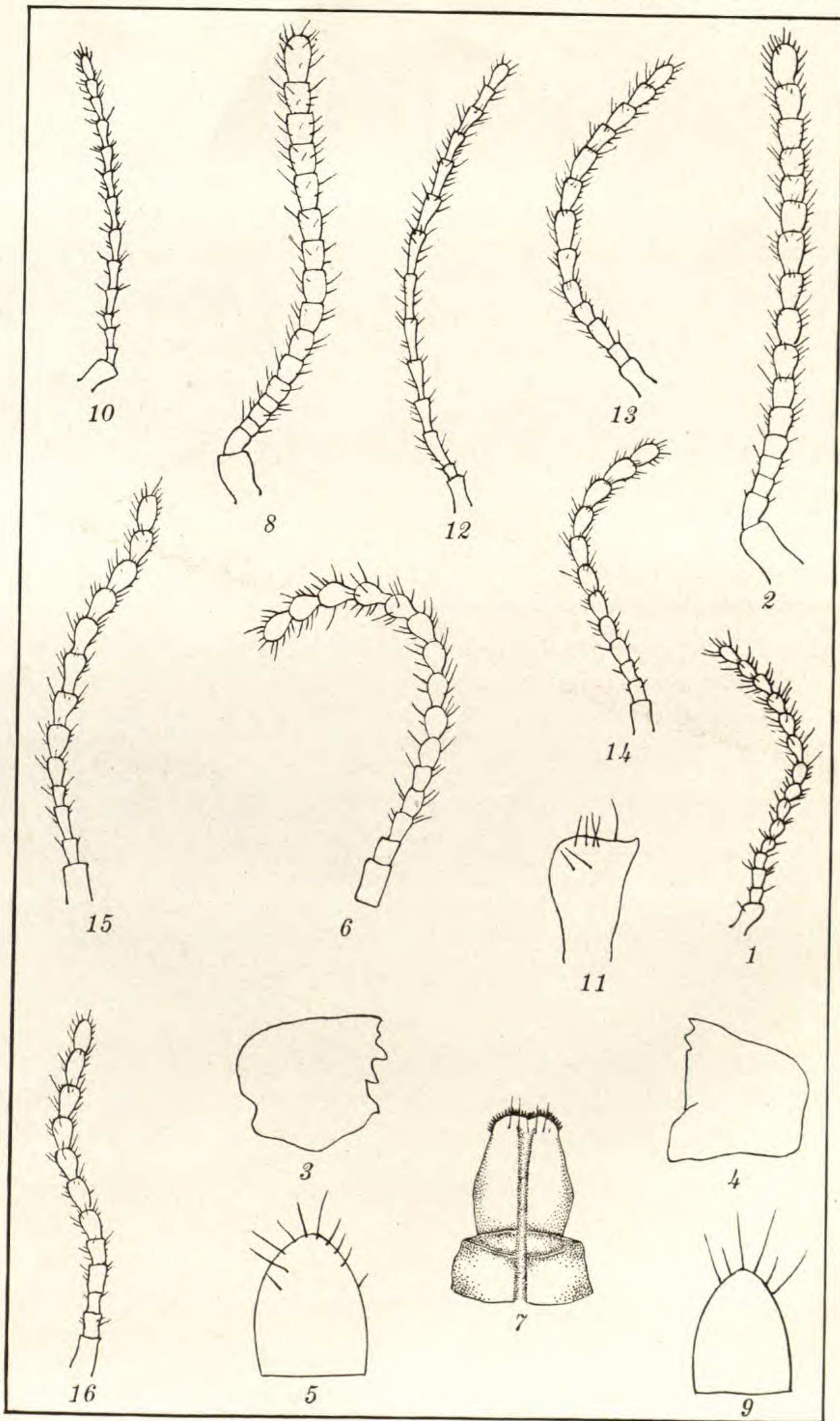


PLATE 4. PHILIPPINE TERMITES.